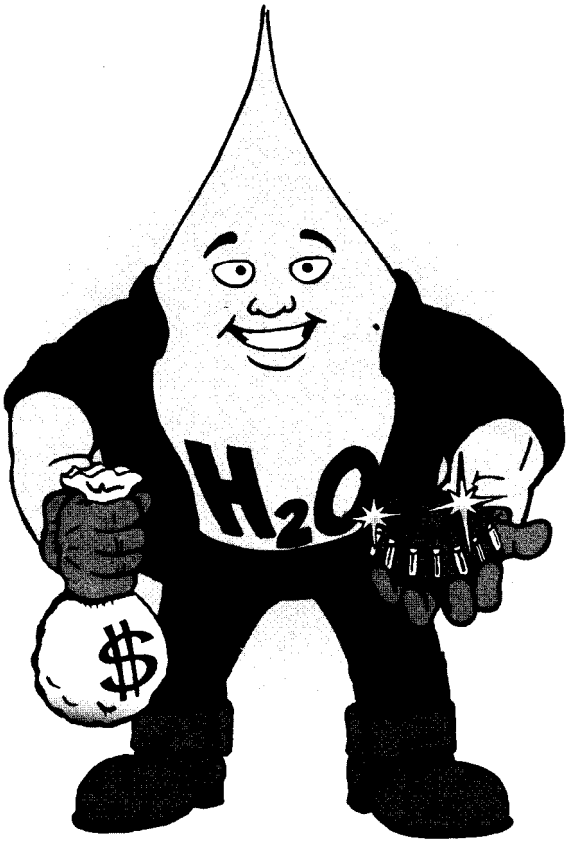
Case Studies in AQUEOUS PARTS CLEANING

Best Environmental Practices for Fleet Maintenance | November 1999



Aqueous Cleaning Works!

The case studies featured in this document are from studies conducted in California between 1997 and 1999. Each of the operations featured in these case studies successfully switched from solvent to aqueous (water-based) parts cleaning, or from one brand of aqueous cleaner to another. These case studies prove that aqueous cleaners are capable of meeting or exceeding the many parts cleaning challenges encountered in a wide variety of fleet maintenance operations.

New Environmental Regulations Lead to Improved Aqueous Cleaners

The emergence of a new generation of highly effective cleaning units and solutions is the direct result of environmental regulations recently passed in two California air districts. To protect human health and reduce smog, aqueous parts cleaning solutions are favored or required over solvent cleaners. These new rules opened the parts cleaning market to new vendors and spurred innovation. Shop owners, facility managers and technicians benefit the most from the new rules, because compared to solvents, aqueous cleaners:

COST LESS • ARE SAFER TO USE • CLEAN EQUALLY WELL

The public also benefits from the overall reduction in volatile organic compounds (VOC) emitted to the air as facilities switch from high VOC solvents to aqueous cleaners. The estimated VOC reductions as a direct result of enacting these new rules are 10 tons per day in the Los Angeles area and 2.1 tons per day in the San Francisco Bay Area! Widespread use of these new aqueous cleaners will hopefully bring about similar benefits nationally.

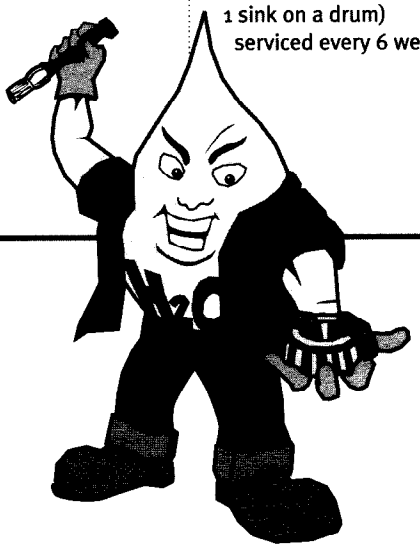
Tips for Successful Conversion

In selecting an aqueous cleaner for your operation, you should test more than one model to identify the model that works best for you. As the case studies show, often more than one type of unit is needed to fulfill all cleaning needs in a fleet (e.g: spray cabinet in combination with microbial sink-top). The good news is; in all but one case featured here, fleets are saving significant money by switching to aqueous cleaning systems. Reduced labor spent cleaning parts account for most of these savings (as with automated spray cabinets and ultrasonic systems). Savings are also achieved through lower waste disposal costs, because aqueous cleaning solutions generally last longer than solvent. For more tips on making aqueous cleaning work for you, see the Best Environmental Practices fact sheet entitled "Aqueous Parts Cleaning, Best Environmental Practices for Fleet Maintenance". It can be obtained by calling (800) 490-9198 or viewed and downloaded at www.epa.gov/region09/p2/autofleet.

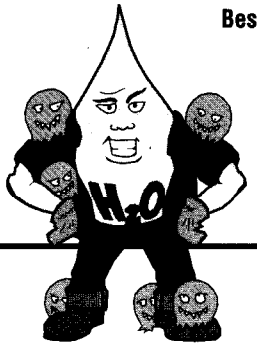
Testing the waters-aqueous parts cleaning case studies from California vehicle maintenance facilities

CASE STUDIES IN AQUEOUS PARTS CLEANING, BEST ENVIRONMENTAL PRACTICES FOR FLEET MAINTENANCE OPERATIONS

Facility	Size	Operations	"Before"	"After"
[3]San Francisco Municipal Railway (MUNI) Diesel Bus Facility– Woods Heavy Duty Section	32 technicians (16 per shift)	Full service– diesel buses. 18 hours/day cleaning parts	13 solvent sinks	4 spray cabinets 1 ultrasonic 2 microbial sink-top 1 immersion
[4]City of Los Angeles General Services Department 7th Street Facility	40 technicians	Full service– construction equipment, light trucks, heavy trucks. 140 hours/week cleaning parts	16 aqueous units: (All Safety Kleen Units; 3 Model 90 sink-top units, 10 Model 91 immersion units, 2 Model 11C carburetor cleaners, 1 Model 81.8 large agitator)	3 spray cabinets 7 immersion units
[4]City of Los Angeles World Airport Fleet Maintenance Facility	40 technicians	Full service– automobiles, light trucks, heavy trucks. 6 hours/week cleaning parts	10 aqueous units: (All Safety Kleen Units; 6 Model 90 sink-tops, 4 Model 91 immersion units)	1 spray cabinet 4 microbial sink-tops
[1]Los Angeles Dept of Water and Power	85 fleet vehicles 2 mechanics 2 machinists 7 electricians	Full service– automobiles, light trucks, heavy trucks. 5 hours/week cleaning parts	3 solvent sinks; (2 immersion, 1 sink on a drum) serviced every 6 weeks	2 non-microbial sink-top units



maintenance facilities



New Unit Types	Unit Cost	Annual Savings*	Payback Period	Testimonial
EMC Jetsink, ALO Jet solution	$1,695	$134,810	3 months	"The spray cabinets reduced our cleaning labor by 80%"
Landa SJ-10, Hotsy Tubmate solution	$3,900			
Safety Kleen TLW-2, Aqua Works solution	$3,850			
Global Sonics Grease Monkey Senior, Brulin 815GD solution	$11,000			"The ultrasonic unit is good for parts with blind passageways"
EcoClean Bioflow 20, PC solution	$1,295			"The microbial units were good for light duty cleaning"
ForBest IPC360, Seawash 700 solution	$1,000			
Mirachem PW-40S (w/skimmer), Mirachem 500 solution	$1,867			"The immersion unit was good for parts with baked-on carbon that could soak for 30 minutes"
Landa SJ-15, AX-IT solution	$8,190	$203,976	3 months	"Parts are so clean, they look like new."
Mirachem PW-40S, Mirachem 500 solution	$3,000			"Cleans very good!"
				"Chemical does not irritate my skin"
				"Removes grease quite easily"
Hydroblast Model 50, PowerClean solution	$14,600	$16,900	1 year	"I'm impressed"
Mirachem PW-20, Mirachem 500 solution	$725			"Outstanding"
				"Works very good"
				"Works fine for light duty cleaning"
Kleentec Model 4000 Unit, Green Unikleen/IPAX solution	$2,200	$4,050	6 months	"It's a good all around cleaner for our shops. We now use less than one can of aerosol cleaner per month"
Gray Mills Model R35037A, Green Unikleen/IPAX solution	$2,200			"It doesn't take long to save some money by changing from mineral spirits to water based cleaning"

*Annual savings includes cleaning labor, waste disposal, servicing, chemical purchase, and electricity costs.

References

We gratefully acknowledge the contributions of the following individuals and organizations whose referenced publications contain the original source material for this fact sheet:

[1] Water-Based Parts Washer Systems: Case Study Conversions prepared for U.S. EPA and Santa Barbara County Air Pollution Control District by Michael Morris and Katy Wolf, Institute for Research and Techncial Assistance, Pollution Prevention Center, December 11, 1998, available at http://home.earthlink.net/-irta/rprt0002.htm

[2] Water-Based Repair and Maintenance Cleaning: Case Study Conversions prepared for Southern California Edison by Michael Morris and Katy Wolf, Institute for Research and Techncial Assistance, Pollution Prevention Center, March 12, 1999, available at http://home.earthlink.net/-irta/rprt0003.htm

[3] Final Report: Aqueous Cleaning Demonstration Project, City and County of San Francisco prepared for the City and County of San Francisco Hazardous Waste Management Program, Administrative Service Department, by Tetra Tech EM Inc., February, 1999. The executive summary of the report is available at www.epa.gov/region09/p2/autofleet. The full copy is at www.p2pays.org/ref/03/02197.pdf.

[4] Final Report: Aqueous Cleaning Demonstration Project, City and County of Los Angeles prepared for the City of Los Angeles Environmental Affairs Department Hazardous and Toxic Materials Office, by Tetra Tech EM Inc., August, 1999. An executive summary of the report is available at www.epa.gov/region09/p2/autofleet.

[5] Aqueous Parts Cleaning, Best Environmental Practices for Fleet Maintenance, part of this publication series.

Case Studies Vendor Contacts

Alpha Cleaning Systems	(805) 520-8057, (800) 729-2828	KleenTec	(800) 435-5336
EcoClean Corporation	(510) 797-4050	Landa, Inc.	(408) 998-3051, (800) 547-8672
EMC	(408) 292-9289, (562) 908-7696	Mirachem	(602) 966-3030, (800) 847-3527
For Best Cleaning Solutions, Inc.	(225) 334-6990	Safety-Kleen Corporation	(800) 344-5191
Global Sonics	(800) 437-7117	UniKleen	(310) 532-0353, (800) 930-4729
Graymills Corporation	(773) 248-6825	W.R. Grace	(708) 458-6811, (800) 854-1623

These vendors were featured in these case studies. Other vendors may provide similar or identical products and services.

Your state or local government environmental agency has more information about compliance and pollution prevention for auto repair shops and fleet maintenance operations in your state or area. Additional fact sheets and information can be found at www.epa.gov/region09/p2/autofleet. This fact sheet is part of a package of fact sheets entitled either "The Pollution Prevention Tool Kit, Best Environmental Practices for Auto Repair" (publication number EPA-909-E-99-001) or "The Pollution Prevention Tool Kit, Best Environmental Practices for Fleet Maintenance" (publication number EPA-909-E-99-002). To obtain copies of either package, call (800) 490-9198. Accompanying videos, "Profit Through Prevention", are available at the same phone number for either auto repair (number EPA-909-V-99-001) or fleet maintenance (number EPA-909-V-99-002).